

Atty. Docket No. OPP031051US
Serial No: 10/722,295

Amendments to the Figures

FIG. 1 has been amended by adding the label “(BACKGROUND)” below the Figure label, as required by the Examiner. A Replacement Sheet (as required by 37 C.F.R. 1.121(d)) is attached to this Amendment.

Remarks

Claim 1 has been amended to include certain limitations originally presented in Claim 6. The remaining claims have been amended for consistency. No new matter is introduced by the present Amendment. Applicant and his representatives wish to thank Examiner for the thorough examination of the present application and the detailed explanations in the Office Action dated June 14, 2005.

The present invention relates to a method of forming a trench in a semiconductor device, including the steps of (a) forming a polish stop layer on a semiconductor substrate, (b) forming an anti-reflection coating on the polish stop layer, (c) selectively etching the anti-reflection coating to form an anti-reflection coating pattern, (d) etching the polish stop layer and etching the semiconductor substrate to a predetermined depth to form a trench such that ends of the polish stop layer adjacent to the trench are rounded, and (e) forming an insulation layer that fills the trench.

The Objection to the Drawings

The objection to drawing FIG. 1 has been obviated by adding the legend “(BACKGROUND)” below the Figure label, as required by the Examiner.

The Objection to the Specification

The objections to the title of the invention and to the specification have been obviated by appropriate Amendment.

The Rejection of Claim 6 under 35 U.S.C. § 112, first paragraph

The rejection of Claim 6 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement has partly been obviated by appropriate amendment and is partly traversed.

The method for producing the anti-reflection coating having rounded ends is disclosed in paragraph 15 of the specification (page 4, line 18 – page 5, line 3):

“An area of the polish stop layer exposed through the anti-reflection coating pattern and the semiconductor substrate to a predetermined depth are etched to form the trench, and ends of the anti-reflection coating pattern and ends of the polish stop layer under the ends of the antireflection coating pattern are etched such that *the ends of the anti-reflection coating* are formed into a rounded configuration.” (Emphasis added.)

Therefore the rejection of Claim 6 under 35 U.S.C. § 112, first paragraph, should be withdrawn.

The Rejection of Claims 2-5, 8-11 and 15-18 under 35 U.S.C. § 112, second paragraph

The rejections of Claims 2-5, 8-11 and 15-18 under 35 U.S.C. § 112, second paragraph for indefiniteness have been obviated by appropriate amendment.

The Rejection of Claims 1-4, 12-17, and 19-20 under 35 U.S.C. § 102(e)

The rejection under 35 U.S.C. § 102(e) of Claims 1-4, 12-17, and 19-20 as being unpatentable over Moore et al. (US 6,884,725) are respectfully traversed.

Moore et al. discloses a method of forming a trench in a semiconductor device, where the method includes forming a polish stop layer on a semiconductor substrate, etching the polish stop layer and etching the semiconductor substrate to a predetermined depth to form a trench, and forming an insulation layer that fills the trench. However, Moore et al. fails to disclose or suggest the steps of forming an anti-reflection coating on the polish stop layer or selectively

etching the anti-reflection coating to form an anti-reflection coating pattern, as recited in Claim 1, above.

All of the remaining claims depend, directly or indirectly, on Claim 1. Therefore the rejections under 35 U.S.C. § 102(e) of Claims 1-4, 12-17, and 19-20 should be withdrawn.

The Rejections of Claims 5 and 18 under 35 U.S.C. § 103(a)

The rejections under 35 U.S.C. § 103(a) of Claims 5 and 8 as being unpatentable over Moore et al. (US 6,884,725) have been addressed by amendment.

As discussed herein, Moore et al. fails to disclose or suggest the steps of forming an anti-reflection coating on the polish stop layer or selectively etching the anti-reflection coating to form an anti-reflection coating pattern, as recited in Claim 1. Claims 5 and 8 depend indirectly on Claim 1. Therefore the rejections under 35 U.S.C. § 103(a) of Claims 5 and 8 should be withdrawn.

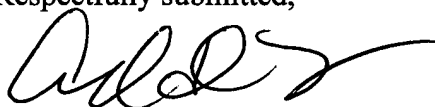
Conclusions

In view of the above amendments and remarks, all bases for objection and rejection are overcome, and the application is in condition for allowance. Early notice to that effect is earnestly requested.

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If it is deemed helpful or beneficial to the efficient prosecution of the present application,
the Examiner is invited to contact Applicant's undersigned representative by telephone.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'A. Fortney', with a long horizontal flourish extending to the right.

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